

CLAIMS

We claim:

- 1 1. A system comprising:
- 2 a memory sized to include lines to store a band of an image and
- 3 additional lines;
- 4 a wavelet processing logic comprising
- 5 a wavelet transform to generate coefficients when applied to
- 6 data in the memory;
- 7 access logic to read data from the memory into the line buffers
- 8 to supply data stored in the memory to the wavelet transform and to store
- 9 coefficients in the memory, such that after data stored at a first pair of lines
- 10 is read from memory into the buffers of the access logic, the access logic
- 11 reuses the first pair of lines to store coefficients generated by the wavelet
- 12 transform that are associated with a second pair of lines different from the
- 13 first pair of lines.

[illegible]

1 4. The system defined in Claim 3 wherein the access logic stores
2 the first outputs of the wavelet transform for each coefficient level in the
3 additional lines within a distance of the offset.

1 5. The system defined in Claim 3 wherein size of the offset is
2 different for each transform level.

1 6. The system defined in Claim 3 wherein the size of the offset is
2 equal to:

$$3 \quad 2^{(\text{transform level of coefficient being stored})}$$

1 7. The system defined in Claim 6 wherein, during decomposition,
2 the offset for storing the first rows of each pair of rows of L1 coefficients in
3 the memory is two lines from the first row of data of the image associated
4 with said each pair of rows of the L1 coefficients, and the offset for storing
5 the first row of each pair of rows of L2 coefficients is four lines from the first
6 row of L1 coefficients associated with said each pair of rows of the L2
7 coefficients.

1 8. The system defined in Claim 1 wherein the access logic stores
2 coefficients associated with a decomposition level greater than level three in
3 the lines of the memory that previously stored the band of the image.

1 9. The system defined in Claim 3 wherein the addition lines
2 relating to the offset are above the line storing the band of the image.

1 10. The system defined in Claim 1 wherein the wavelet transform
2 is a forward wavelet transform.

1 11. The system defined in Claim 1 wherein the wavelet transform
2 is an inverse wavelet transform.

1 12. A method comprising:
2 reading data from a memory into line buffers to apply a wavelet
3 transform thereto; and
4 storing coefficients created by applying the wavelet transform at lines
5 in the memory so that each set of coefficients generated from data stored at
6 each pair of lines in the memory is stored in the memory at lines that are at
7 an offset with request to said each pair of lines in the memory.

1 13. The method defined in Claim 12 further comprising access
2 logic reusing a first pair of lines to store coefficients generated by a wavelet
3 transform, that are associated with a second pair of lines different from the
4 first pair of lines, after data stored at a first pair of lines is read from memory
5 into the buffers of the access logic, and wherein a first line of each of the first
6 and second pairs of lines are located in the memory at an offset with respect
7 to each other.

1 14. The method defined in Claim 13 further comprising the access
 2 logic storing the first outputs of the wavelet transform for each coefficient
 3 level in additional lines within a distance of the offset.

1 15. The method defined in Claim 13 wherein size of the offset is
 2 different for each transform level.

1 16. The method defined in Claim 13 wherein the size of the offset
 2 is equal to:
 3 $2^{(\text{transform level of coefficient being stored})}$

1 17. The method defined in Claim 16 wherein, during
 2 decomposition, the offset for storing the first rows of each pair of rows of L1
 3 coefficients in the memory is two lines from the first row of data of the
 4 image associated with said each pair of rows of the L1 coefficients, and the
 5 offset for storing the first row of each pair of rows of L2 coefficients is four
 6 lines from the first row of L1 coefficients associated with said each pair of
 7 rows of the L2 coefficients.

1 18. The method defined in Claim 12 further comprising access
2 logic storing coefficients associated with a decomposition level greater than
3 level three in the lines of the memory that previously stored the band of the
4 image.

1 19. The method defined in Claim 13 wherein the addition lines
2 relating to the offset are above the line storing the band of the image.

1 20. An article of manufacture comprising at least one recordable
2 media storing executable instructions thereon which, when executed by a
3 processing device, cause the processing device to:

4 read data from a memory into line buffers to apply a wavelet
5 transform thereto; and

6 store coefficients created by applying the wavelet transform at lines in
7 the memory so that each set of coefficients generated from data stored at
8 each pair of lines in the memory is stored in the memory at lines that are at
9 an offset with request to said each pair of lines in the memory.

1 21. The article of manufacture defined in Claim 20 further
2 comprising instructions, which when executed by the processing device
3 cause the processing device to reuse a first pair of lines to store coefficients
4 generated by a wavelet transform, that are associated with a second pair of
5 lines different from the first pair of lines, after data stored at a first pair of
6 lines is read from memory into the buffers of the access logic, and wherein a
7 first line of each of the first and second pairs of lines are located in the
8 memory at an offset with respect to each other.

1 22. An apparatus comprising:
2 means for reading data from a memory into line buffers to apply a
3 wavelet transform thereto; and
4 means for storing coefficients created by applying the wavelet
5 transform at lines in the memory so that each set of coefficients generated
6 from data stored at each pair of lines in the memory is stored in the memory
7 at lines that are at an offset with request to said each pair of lines in the
8 memory.

Sub
17